L 9677-66

ACC NR: AP5027605

arc welding technique is particularly suitable for the welding of heat-exchanger tubes with diameters of less than 10 mm, i.e. in cases where other welding methods do not assure a sufficient quality of joining or simply are not feasible. Orig. art. has: 3 figures.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 003/ OTH REF: 001

Card 3/3

L 23456-66 EWT(d)/EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h) IJP(c) JD/HW 4C

ACC NR: AP6006332 (N) SOURCE CODE: UR/0413/66/000/002/0056/0057

AUTHOR: Yakovlev, V. A.; Dubrovskiy, S. M.; Lykova, Z. V.; Berman, A. S.; Lyubavskiy, K. V.; Antonov, Ye. G.; Smirnov, A. G.; Makharev, V. I.; Vesenko, N. V.

ORG: none

TITLE: Device for automatic welding of hardening steels. Class 21, No. 177981

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1966, 56-57

TOPIC TAGS: automatic welding, induction welding, steel

ABSTRACT: An Author Certificate has been issued for a device for automatic welding of hardening steels. The device consists of an automatic welder and an inductor. To make it possible to control the heating rate, the welder and conductor have a movable interconnection which can by adjusted by a screw or a rod. [LD]

SUB CODE: 13/ SUBM DATE: 31Jan63/ ORIG REF: none/ OTH REF: none/

Card 1/1 VLR UDC: 621.791.037:621.078.012

L 60715-65 EWT(m)/EWP(k)/T/EWP(w)/EWP(v)/EWP(t)/ETI IJP(c) JD/JG
ACC NR: AP6031409 SOURCE CODE: UR/0135/66/000/009/0015/0018

AUTHOR: Lyubavskiy, K. V. (Doctor of technical sciences); L'vova, Ye. P. (Engineer); German, S. I. (Candidate of technical sciences)

ORG: [Lyubavskiy, L'vova] TsNIITMASh; [German] KhTGU im. S. M. Kirova

TITLE: Welding gas-turbine housings built of heat-resistant fully austenitic steel

SOURCE: Svarochnoye proizvodstvo, no. 9, 1966, 15-18

TOPIC TAGS: ~~steel~~ welding, austenitic steel, ~~welding~~ heat resistant steel, ~~welding~~ weld property/EI725 austenitic steel

ABSTRACT: The weldability of electroslag-melted EI725 fully austenitic steel intended for housings of gas-turbines operating at 750—780C has been investigated. Steel specimens 15—25 mm thick were welded with TsT-22 electrodes, austenitized at 1120C, and stabilized at 800C for 12 hr. After this treatment the welds had a tensile strength of 28.6—31.9 kg/mm^2, a yield strength of 22.6—26.2 kg/mm^2, an elongation of 28.0—29.0%, a reduction of area of 60.0—64.0%, and a notch toughness of 8.1—8.6%. Aging at 800C for 100 hr increased the tensile and yield strength to 33.2—39.7 kg/mm^2 and 29.4—33.7 kg/mm^2, respectively, with a significant effect on elongation and reduction of area, but lowered the notch toughness to 4.5—5.0 mkg/cm^2. Aging for 1000 hr did not produce significant additional changes in mechanical prop-

Card 1/2 UDC: 621.791.753.042.4:669.14.018.44:621.438

L 45571-66
ACC NR: AP6031409

4

erties. The rupture strength of welds at a short rupture life (100—1000 hr) was lower than that of the base metal. However, at a rupture life of 5000 hr, both the weld and the parent metal had the same rupture strength: 6—7 kg/mm^2. The structure of the weld after aging consisted of austenite, as $Fe_3(Mo, W)_2$ and $Fe_2(Mo, W)$. Prolonged aging has little or no additional effect on phase composition. Relaxation tests showed that residual stresses can be relieved by austenitizing at 950—1100C followed by stabilization annealing at 750C. TsT-22 electrodes were used for welding the housing of the GTU-500 gas turbine. Orig. art. has: 9 figures and 2 tables. [ND]

SUB CODE: 13, 11/ SUBM DATE: none/ ORIG REF: 007/ ATD PRESS: 5082

Card 2/2 hs

L 07461-67 EWT(m)/EWP(w)/EWP(k)/EWP(v)/ETC(c) JD/HM

ACC NR: AP6035505 SOURCE CODE: UR/0135/66/000/011/0039/0039

35
32
B

AUTHOR: Lyubavskiy, K. V. (Doctor of technical sciences); Bad'yanov, B. N. (Candidate of technical sciences)

ORG: [Lyubavskiy] TsNIITMASh; [Bad'yanov] MIEM

TITLE: The AV-5 flux for welding high-strength steels

SOURCE: Svarochnoye proizvodstvo, no. 11, 1966, 39-40

TOPIC TAGS: ~~steel~~ metal welding, high strength steel ~~welding, submerged~~ arc welding, welding flux, weld property/VP-25 steel, SP-28 steel

ABSTRACT: A new AV-5 flux (Author Certificate No. 189296) containing 15.0—20.0% SiO_2, 18.0—23.5 Al_2O_3, 12.0—18.0% CaO, 35.0—45.0% CaF_2, 4.0—5.0% NaF, and 3.0% K_2O + Na_2O, intended for submerged arc welding of superstrength steels, has been developed. The new flux ensures a stable welding process, very satisfactory weld formation, easy slag separation and high strength and impact toughness of welds. It can be prepared in arc or induction furnaces by applying the method of B. N. Bad'yanov and Ye. G. Antonov. Heat-treated (hardened and tempered) welds in VP-25 steel made with the new flux and 20KhSNVFA electrode wire had a tensile strength of 144 kg/mm^2, a yield strength of 137 kg/mm^2, an elongation of 9.1%, and a reduction of area of 48.5%. Corresponding figures for argon-shielded arc welds were 135 kg/mm^2, 129 kg/mm^2, 3.7% and 29.6%, and for the base metal, 161 kg/mm^2, 149 kg/mm^2, 12% and

Card 1/2 UDC: 621.791.04:669.14.018.295

L 07461-67

ACC NR: AP6035505

57%. Welds in SP-28 steel made with AV-5 flux and SP-28 electrode wire had a tensile strength of 160 kg/mm^2, a yield strength of 149 kg/mm^2, an elongation of 9.7%, and a reduction of area of 45.2% compared to 156 kg/mm^2, 155 kg/mm^2, 9.27%, and 47.9% for argon-shielded arc welds, and 163 kg/mm^2, 160 kg/mm^2, 8.35% and 44.7% for base-metal welds. The notch toughness of welds in both steels (9.8—10.3 mkg/cm^2) was higher than that of the base materials (7.0—7.7 mkg/cm^2). AV-5 flux is presently used by several machine-building plants in production-scale welding of VP-25, SP-28 and EP961 steel structures.

SUB CODE: 13, 11/ SUBM DATE: none/ ORIG REF: 002/ ATD PRESS: 5104

Card 2/2 fjrm

ACC NR: AP6018012 (N) SOURCE CODE: UR/0413/66/000/010/0126/0126

INVENTORS: Lyubavskiy, K. V.; L'vova, Ye. P.; Sukhov, L. V.; Yarovinskiy, L. M.; Tarnovskiy, A. I.; Ryabchenkov, A. V.; Gerasimov, V. I.; Iodkovskiy, S. A.

ORG: none

TITLE: Welding electrode. Class 49, No. 181968 [announced by Scientific Research Institute of Technology and Machine Construction (Nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 10, 1966, 126

TOPIC TAGS: welding, welding electrode, austenite steel, carbon, silicon, manganese, chromium, nickel, molybdenum, niobium, sulfur, phosphorus

ABSTRACT: This Author Certificate presents a welding electrode for welding austenite steels containing carbon, silicon, manganese, chromium, nickel, molybdenum, niobium, sulfur, and phosphorus. To increase the resistance of welded seam to corrosion, the electrode composition is taken in the following percent relationship: carbon—not over 0.05; silicon—not over 0.45; manganese 2—10; chromium 19—25; nickel 33—50; niobium 0.8—1.2; molybdenum 2.5—7.5; sulfur or phosphorus—not over 0.02 of each.

SUB CODE: 13/ SUBM DATE: 29Apr65

Card 1/1 UDC: 621.791.042.2

ACC NR: AP7002612 (A, N) SOURCE CODE: UR/0413/66/000/023/0123/0123

INVENTOR: Lyubavskiy, K. V.; Bad'yanov, B. N.; Babanov, B. P.; Nud'ga, V. L.; Yarovinskiy, Yu. L.; Miroshin, D. D.

ORG: None

TITLE: A flux for electric arc welding. Class 49, No. 189296

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 23, 1966, 123

TOPIC TAGS: arc welding, aluminum oxide, silicon dioxide, low alloy steel

ABSTRACT: This Author's Certificate introduces a flux for electric arc welding containing SiO_2, CaO, Al_2O_3, CaF_2, NaF, TiO_2, MgO and Na_2O+K_2O. The material contains the following percent composition for increased strength and ductility of welded joints made from low-alloy steels: SiO_2 10-20; CaO 10-20; Al_2O_3 15-23.5; CaF_2 30-55; NaF 1-10; TiO_2 0-10; MgO 0-5; Na_2O+K_2O 01-5.

SUB CODE: 11, 13/ SUBM DATE: 15 Jun65

Card 1/1

UDC: 621.791.75.048

0930 3738

ACC NR: AP7005237 (N) SOURCE CODE: UR/0145/66/000/009/0168/0172

AUTHOR: Lyubavskiy, K. V. (Doctor of technical sciences, Professor); Bad'yanov, B. N. (Candidate of technical sciences)

ORG: Moscow Institute of Electronic Machine Building (Moskovskiy institut elektronnogo mashinostroyeniya)

TITLE: Flux for welding high-strength steels

SOURCE: IVUZ. Mashinostroyeniye, no. 9, 1966, 168-172

TOPIC TAGS: welding technology, high strength steel, impact strength

ABSTRACT: AV-4 non-oxidative flux is recommended for improving the impact ductility of automatically welded joints in high-strength grades of steel. This flux has the following composition (in %): SiO_2--5; Al_2O_3--7; KCl--10; NaF--5; (K_2O+Na_2O)--3; CaF_2--70. The properties of welded joints in 25KhSNVFA steel using 20KhSNVFA electrode wire and AV-4 flux were compared with those of joints made under identical conditions using AN-348A (42% SiO_2 and 36% MnO) and AN-15 (26% SiO_2 and 2.5% MnO). Chemical analysis of the resultant joints shows that the oxidative capacity of the flux increases with the concentration of silicon and manganese oxides. The concentration of all alloying elements in joints made with AV-4 flux is close to the initial composition and the reduced oxygen concentration increases the impact ductility of the joints.

Card 1/2 UDC: 621.791.04

ACC NR: AP7005237

These joints are less sensitive to impact loads at normal and low temperatures and are less liable to develop cracks which increases their operational reliability. An entirely new flux, AV-5, has also been developed on the basis of AV-4 flux and has better technological properties from the standpoint of seam formation. This new flux is designed for welding parts from VP-25 and SP-28 steels. Orig. art. has: 3 figures, 2 tables.

SUB CODE: 13, 11/ SUBM DATE: 27May65/ ORIG REF: 22/ OTH REF: 01

Card 2/2

LYUBAVSKIY, M.

Preparing for the economic geography lesson. Geog. v shkole 22 no.1:61-62 Ja-F '59. (MIRA 12:4)

1. Nizhne-Tagil'skaya shkola rabochey molodezhi No.17.
(Geography, Economic--Study and teaching)

LYUBAVSKIY, V. L.

KLIMOV, A.N.

23(5) PHASE I BOOK EXPLOITATION SOV/1592

Leningrad. Inzhenerno-ekonomicheskiy institut

Organizatsiya i planirovaniye ravnomernoy raboty mashinostroitel'nykh predpriyatiy; Mezhvuzovskoye soveshchaniye. Doklady (Organization and Planning of Uniform Work in Machine-building Enterprises; Conference of Vuzes. Reports) Moscow, Mashgiz, 1958. 488 p. (Series: Its: Trudy, vyp.22) 4,000 copies printed.

Eds.: S.A. Volkov, and L.G. Tatevosov.; Tech. Ed.: L.V. Sokolova; Managing Ed. for Literature on Machine-building Technology (Mashgiz): Ye.P. Naumov, Engineer.

PURPOSE: This collection of articles is intended for engineering and technical personnel in machine-building establishments, and for scientific workers and students of institutes and departments of engineering and economics.

COVERAGE: This collection of articles contains reports by workers from vuzes, scientific research institutes, and industrial establishments presented at the conference of vuzes on the subject: "Organization and Planning of Uniform Operations in Machine-building Establishments." These reports discuss general problems encountered in organization, analysis, and theory of uniform production, as well as problems in schedule planning, technical preparation, and production specialization.

Card 1/8

Lyubavskiy, V.L., Docent, Candidate of Technical Sciences (Leningrad Institute of Engineering and Economics). Planning Rhythmic Processes of Machining Parts in Lot Production 188

AYZENBERG, B.L.; BOLOTOV, V.V.; BRIL', R.Ya.; GERASIMOV, V.N.; GREKOV, V.I.; DOVETOV, M.Sh.; KAMENSKIY, M.D.; KLEBANOV, L.D.; KONSTANTINOV, B.A.; KUZ'MIN, V.G.; LYUBAVSKIY, V.I.; MELENT'YEV, L.A.; MIKHALEV, N.N.; POLYANSKIY, V.A.; RAZDROGINA, L.A.; SIVAKOV, Ye.R.; STARIKOV, V.G.; SAVASHINSKAYA, V.I.; SHAYOVICH, L.L.

Igor' Valentinovich Gofman, 1903-1963; obituary. Trudy LIEI no.51:3-4 '64. (MIRA 18:11)

LYUBAVSKIY, V.I., dots., kand.tekhn.nauk

Designing rhythmical processes for machining parts manufactured in lots. Trudy LIMI no.22:188-204 '58. (MIRA 11:12)

1. Leningradskiy inzhenerno-ekonomicheskiy institut.
(Industrial management)

ALEKSEYEV, V.F.; TIKHONOVA, A.S.; LYUBAVSKIY, V.K., veterinarnyy vrach po boleznyam ptits

For the establishment of healthy poultry flocks. Veterinariia 42 no.8:4-6 Ag '65. (MIRA 18:11)

1. Direktor Vitebskoy ptitsefabriki (for Alekseyev). 2. Glavnyy veterinarnyy vrach Vitebskoy pritsefabriki (for Tikhonova). 3. Vitebskaya oblastnaya veterinarnaya laboratoriya (for Lyubavskiy).

GORELYSHEV, N. V.; BAGDASAROV, S. M.; LOBZOVA, K. Ya.; LYUBAVTSEVA, T. N.; AVLASOVA, N. M.; FAYNBERG, E. S.

Laying rough-surfaced asphalt-concrete pavements. Avt. dor. 25 no.10:4-6 O '62. (MIRA 15:10)

(Pavements) (Asphalt concrete)

KUTSAY, Sh.Ya.; LYUBCHAK, M.V.; ZERNYAKOVA, B.S.

Using molten metal instead of inget bars in making silumin alloys in electric furnaces. Suggestion by Sh.IA.Kutsai, M.V.Liubchak, B.S.Zerniakova. Prom.energ. 11 no.3:22 Mr '56. (MLRA 9:7)

1.Ural'skiy Kirovskiy zavod.
(Silumin)

LYUBCHANKO, V.M. [Liubchanka, V.M.]

Effect of seed quality on seedling in the small-leaved linden tree. Vestsi AN BSSR. Ser. biial. nav. no.2:35-40 '61. (MIRA 14:7)
(LINDEN) (SEEDS)

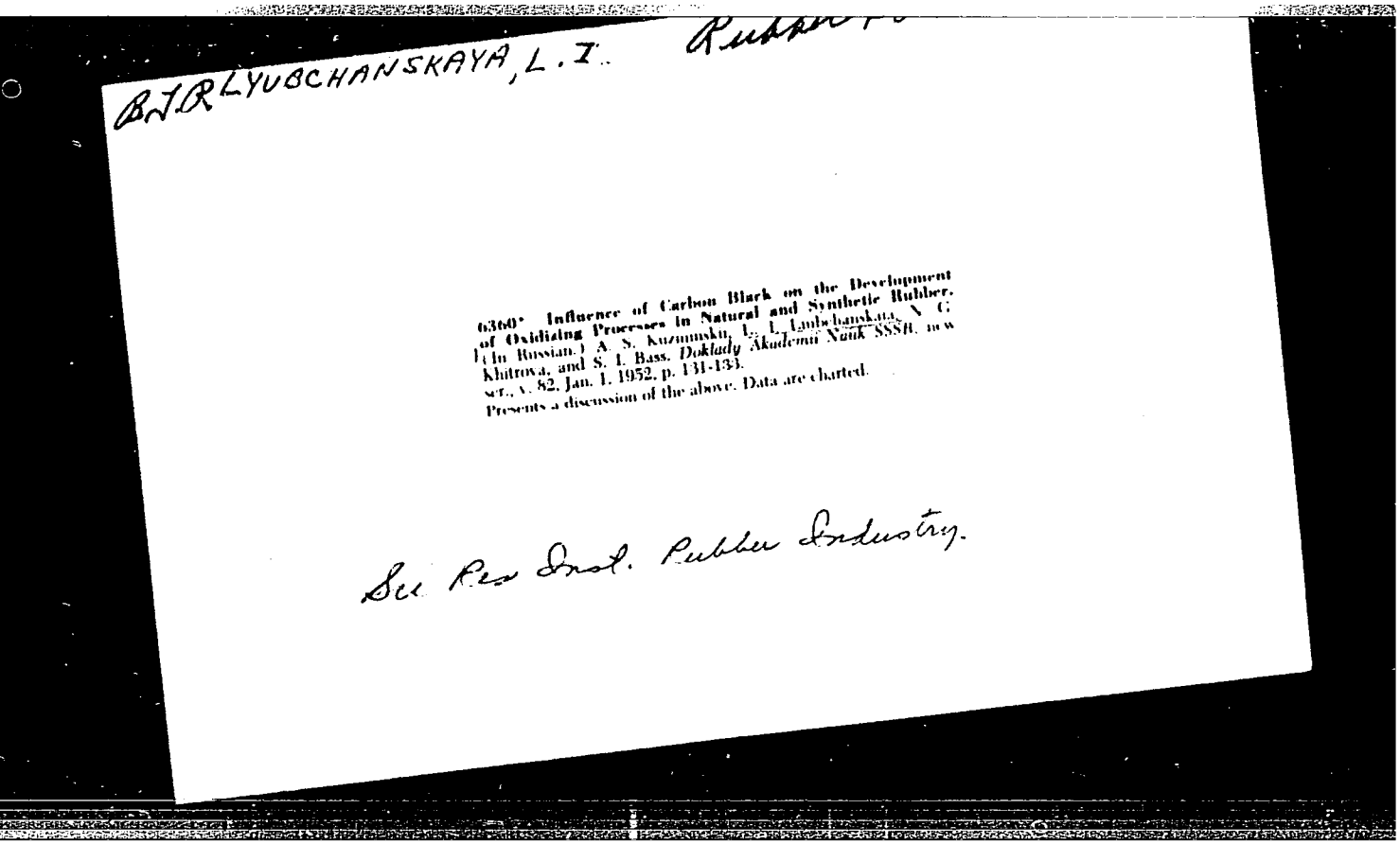
LYUBCHANSKAYA, L. I.

2082. Influence of oxygen upon rubber (unvulcanised) containing antioxidants. A. S. Kuz'minskii, N. N. Lezhnev and L. I. Lyubchanskaya. Sbornik Kauchukov i Rezin . . . 1939, p. [illegible], 129–30. The work relates to natural and synthetic rubbers. The method investigated by the authors makes it possible to determine the true ratio of inhibited oxidation and so to establish: *a*) the true relaxation capacity of various polymers; *b*) the calculation of a series of kinetic constants; *c*) the influence of activation, in particular activation by heavy metal salts; *d*) the existence of mechanical activation of the process of oxidation and its peculiarities; *e*) the influence of diffusion upon the rate of true oxidation of unvulcanised and vulcanised rubbers; *f*) the connection between the rates of initiation and of the change in physical-mechanical properties of vulcanisates; *g*) the dependence between the action of one or several inhibitors, and the non-additivity of this action. The process of oxidation of rubber in the presence of a true inhibitor is different in principle from uninhibited oxidation. The methods devised have made it possible to detect and investigate the phenomena of mechanical activation both in repeated deformation by stress and in the plasticisation of unvulcanised rubber, and to realise the conditions necessary for the investigation of the progress of structurisation in the absence of oxygen. There are 9 references and the discussion is reported.

332331

KUZ'MINSKIY, A.S.; LYUBCHANSKAYA, L.I.

Changes of the mechanical properties of vulcanizates during the early stages of thermal oxidation. Colloid.J. (U.S.S.R.) 14, 43-8 '52 [Engl. translation].
(CA 47 no.19:10266 '53)



BJR LYUBCHANSKAYA, L. I.

6360* Influence of Carbon Black on the Development of Oxidizing Processes in Natural and Synthetic Rubber. (In Russian.) A. S. Kuzminskii, L. I. Liubchanskaia, N. G. Khitrova, and S. I. Bass. *Doklady Akademii Nauk SSSR*, new ser., v. 82, Jan. 1, 1952, p. 131-133.
Presents a discussion of the above. Data are charted.

Sci Res Inst. Rubber Industry.

LYUBCHANSKAYA, L.I.

B. T. R.
Vol. 3 No. 4
Apr. 1954
Rubber and Elastomers

5729* Effect of Carbon Black on the Development of Oxidation Processes in Raw and Vulcanized Rubbers. A. S. Kuzminskii, L. I. Lyubchanskaya, N. G. Khitrova, and S. I. Bass. *Rubber Chemistry and Technology*, v. 26, Oct.-Dec. 1953, p. 858-861. (Translated from *Doklady Academii Nauk Soyuza Sovetskikh Sotsialisticheskikh Republik*, v. 85, no. 1, 1952, p. 131-133.

MF
11-5-54

LYUBCHANSKAYA, L. I.

4

6

Processes caused by the thermal breakdown of sulphur bonds in vulcanisates. A. S. Kuz'minskiĭ and L. I. Lyubchanskaya (*Doklady Akad. Nauk. SSSR*, 1953, 90, 409—412).—Vulcanisates containing the C–S_n–C linkage oxidise at a lower rate than thermo-vulcanisates (C–C linkage only), indicating that S_n free-radicals are oxidation inhibitors; they also inhibit the oxidation of phenyl-β-naphthylamine, apparently by the same mechanism (combination with oxidant). Monosulphidic bonds are too stable and so do not affect the oxidation of vulcanisates. Changes in the elastic modulus of vulcanisates containing the three types of bond, on heating at 130°, are discussed.

R. C. MURRAY.

LYUBCHANSKAYA, L. I.

Mechanical activation of the oxidation of vulcanisates under static and alternating loads. A. S. Kuz'minskii and L. I. Lyubchanskaya (*Dokl. Akad. Nauk. SSSR*, 1953, 93, 510—522). The rate of oxidation of vulcanisates, measured by the rate of consumption of phenyl-β-naphthylamine, is considerably raised by stressing it, and still more by load cycling. When maintained under a continuous load during oxidation, vulcanisates rupture in mechanical tests considerably earlier than those not under static stress. The differences in the behaviour of samples containing mono- and poly-sulphide bonds is discussed.

R. C. MURRAY.

Sci Res Inst. Rubber Industry

ЛЮБЧАНСКАЯ, Л. И.

USSR/Chemical Technology. Chemical Products and Their Application -- Crude rubber, natural and synthetic. Vulcanized rubber, I-21

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6031

Author: Kuz'minskiy, A. S., Lyubchanskaya, L. I.

Institution: None

Title: Effect of Mechanical Stresses on Oxidative Processes

Original Publication: Sb. Stareniye i utomleniye kauchukov i rezin i povysheniye ikh stoykosti. L., Goskhimizdat, 1955, 89-99

Abstract: An investigation was made of the consumption of phenyl-beta-naphthyl-amine during aging of sulfur- (with polysulfide) and of thiuram- (with monosulfide linkages) culvanizates in unstressed and stressed state. Consumption of antioxidant in stressed polysulfide vulcanizate (accelerator DPG) is lower than in an analogous monosulfidic. Polysulfidic vulcanizates also show (in N_2 medium) an approximately 2 times greater resilience on repeated deformation, than the monosulfidic. Changes in mechanical properties of samples during the

Card 1/2

USSR/Chemical Technology. Chemical Products and Their Application -- Crude rubber, natural and synthetic. Vulcanized rubber, I-21

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6031

Abstract: process of aging (building-up of irreversible deformation on static load) and considerably more rapid diffusion of the polysulfide S, as compared with the monosulfide S (determined by isotope exchange method), indicate greater mobility of polysulfide linkages, which are capable of undergoing rearrangement, of equalizing overstresses and precluding development of disintegration foci. On the other hand the mobility of polysulfide linkages has a detrimental effect in thermal aging under unstressed conditions.

Card 2/2

LYUBCHANSKAYA, L.I.; SHLYAKHMAN, A.A.; KUZ'MINSKIY, A.S.

Apparatus for testing axial compression stress relaxation of elastic materials. Kauch. i rez. 16 no.2:31-33 F '57. (MIRA 12:3)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti.
(Rubber, Testing)

SOV/138-58-6-2/25

AUTHORS: Kuz'minskiy, A.S. and Lyubchanskaya, L.I.

TITLE: Methods for Evaluating the Guarantee Period for which Rubber may be kept (O metodakh otsenki garantiynykh srokov khraneniya rezin)

PERIODICAL: Kauchuk i Rezina, 1958, Nr 6, pp 3 - 8 (USSR)

ABSTRACT: Plants and apparatus which are fitted with rubber parts are more exposed to the aggressive action of the medium than materials such as metals, enamel, glass, etc. Ageing of the rubber occurs, which is due to atmospheric agents (oxygen, ozone, etc.). This ageing is characterised by irreversible changes in the properties of the material (strength, elasticity, residual deformation, hardness, etc.). Reversible changes of the mechanical properties of rubbers can be observed during investigations at high temperatures, but these should not be confused with irreversible changes of the same properties during ageing. Experiments were carried out on non-tensioned rubbers. Various physical-mechanical properties of rubber e.g., the relative elongation at break and the medulus of elasticity change during ageing of natural rubbers. A linear

Card 1/6

Methods for Evaluating the Guarantee Period for which Rubber may be kept

relation is observed, sometimes, between the relative elongation and the quantity of absorbed oxygen (data on the oxidation of NK and on SKN-26 were computed by L.G. Angert). The work of N.N. Lezhnev (Reference 15) is mentioned, and the following conclusions are made: (a) in wide temperature limits (from room temperature to 150°C) the temperature coefficients for the rate of change of various properties of rubbers vary between 1.8 - 3.5. The ageing of rubber 2959 (based on natural rubber), in air and also in nitrogen, at 90°C, is shown in a graph (Fig 1); (b) rubbers based on natural rubber have higher temperature coefficients than rubbers based on synthetic rubber. Extrapolation calculations of the thermal dependence of the rate of chemical processes are given. The accuracy of these calculations, which are based on the Arrenius equation, is discussed. Graphs for the kinetic changes of relative elongation during the ageing of rubber 2959 at 90°, 70° and 50°C are given in Fig 2. Table 1 gives data on the ageing of rubber (based on NK) with various vulcanisation groups. Fig 3 shows thermal

Card 2/6

Methods for Evaluating the Guarantee Period for which Rubber may be kept

dependence of the rate of oxidation of rubbers. The ageing of rubber, subjected to load, was investigated. Mechanical stresses cause a breaking-up of the molecular chains, and especially of the weaker polysulphide bonds, and a regrouping of the sulphur bonds occurs. Figs 4 & 5 give data on the thermal effect on rubbers of various structure in air and in vacuum. The chemical relaxation was tested on the apparatus constructed by L.I. Lyubcharskaya, A.A. Shlyakhman and A.S. Kuz'minskiy (Ref. 14). When rubber is aged while subjected to stress, intermolecular bonds are destroyed, but at the same time, new bonds are created and deformations become permanent. Fig 6 shows how deformation or permanent set increases at the same time as the stress in the rubber decreases. Stress is plotted as a fraction of the original stress in the rubber, and elongation as a percentage of the original dimension of the loaded specimen. The test is conducted over a duration of 160 hours at a temperature of 90°C. The physical and mechanical coefficients for ageing which

Methods for Evaluating the Guarantee Period for which Rubber may be Kept

are satisfactory for predictions with unstressed rubbers, are inapplicable to rubber aged under stress. In Fig 7, curves 1 and 3 show the strength (kg/cm^2), and proportional elongation (L %) for unstressed rubbers, with respect to time of ageing while the rubber was at a temperature of 70°C. Curves 2 and 4 show the same functions for the rubber while stressed by an extension to 50% of its original dimension. Curve 5 shows residual deformation or permanent set. The strength and elasticity, in both stressed and unstressed conditions, change with respect to ageing at almost the same rate, i.e. the curves do not reflect the specific ageing of the stressed rubber. While the proportional elasticity and the strength has fallen to 20 - 30% of the initial value in both cases, permanent set has increased to 80 - 90% in the stressed rubber. Specific ageing of stressed rubber depends on "auto-relaxation" of the molecular structure. Acceptable indices of ageing in stressed rubbers are, therefore, permanent set and relaxation of stress (chemical relaxation). The

Card 4/6

Methods for Evaluating the Guarantee Period for which Rubber may be kept

latter is the index which properly determines the mechanical behaviour of rubber when aged while under stress. Curves 1, 2 and 3 in Fig 9 show the stress relaxation on ageing for different degrees of initial compression, while curve 4 shows that the percentage permanent set is about the same for all three initial conditions. Summarizing: the dependence of the rate of ageing with temperature is a primary factor when defining the stability of rubber. For rubber under unstressed conditions, proportional elongation, breaking strength and modules are suitable indices of ageing. These indices are not applicable for rubber aged under stress. The loss in working properties of rubber when aged under stress is a function of two causes: chemical relaxation of stress, and increase in permanent set. The rates of change of these two functions are suitable indices for predicting the effect of ageing of rubber while under stress.

Methods for Evaluating the Guarantee Period for which Rubber may be kept

Mechanical loads, apart from activating oxydation processes, lead both to disruption and to formation of molecular bonds. Permanent set is the external manifestation of these processes.

There are 9 figures, 1 table and 15 references (6 English, 1 French and 8 Soviet)

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Research Institute of the Rubber Industry)

1. Rubber--Life expectancy 2. Rubber--Test results
3. Rubber--Mechanical properties

Card 6/6

S/020/60/135/006/028/037
B004/B056

AUTHORS: Lyubchanskaya, L. I. and Kuz'minskiy, A. S.

TITLE: The Destruction of Molecular Chains and the Decomposition of Cross Links in the Aging of Vulcanizates

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 6, pp. 1436 - 1438

TEXT: It is the purpose of the present paper to clear up the problem as to what structural elements of vulcanizates undergo aging. The chemical relaxation of the strain of various vulcanizates was investigated. 1) Natural rubber. 2) СКБ (SKB) synthetic rubber, the cross links of which either a) consisted for the most part of monosulfide bonds, or b) for the most part of polysulfide bonds. For monosulfide cross links it was found that the kinetic curves for both natural rubber and SKB follow the equation $\sigma_t = \sigma_o \exp(-kt)$. The constants of the reaction rate for natural rubber are $1.54 \cdot 10^{-3}$ h^{-1}, and for SKB, $2.1 \cdot 10^{-4}$ h^{-1}. Reduction of oxygen pressure from atmospheric pressure to 1 mm Hg lowers the reaction rate to

Card 1/2

The Destruction of Molecular Chains and the Decomposition of Cross Links in the Aging of Vulcanizates

S/020/60/135/006/028/037
B004/B056

1/5. It follows herefrom that the chemical relaxation in this case is caused by oxidative decomposition of the polymer chains. In polysulfide cross links, or the other hand, the relaxation rates for both kinds of rubber are similar: natural rubber: $4.2 \cdot 10^{-2}$ h^{-1}; SKB: $3.1 \cdot 10^{-2}$ h^{-1}. Removal of oxygen is without influence. Herefrom, the following conclusions are drawn. In the aging process of vulcanizates two competing reactions occur: a) oxidative destruction of the molecular chains of the polymers; b) thermal decomposition of the sulfide cross links. In the case of firm cross links (monosulfide), reaction a) predominates. The relaxation rate then depends on the oxidizability of the polymers and on the concentration of oxygen. If, however, the network of the vulcanizate is formed by polysulfide cross links, whose thermal decomposition is stronger by one order of magnitude than the oxidative destruction, reaction b) will predominate. There are 2 figures and 5 references: 3 Soviet and 4 US.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry)

PRESENTED: July 6, 1960, by P. A. Rebinder, Academician
SUBMITTED: June 30, 1960

Card 2/2

LYUBCHANSKAYA, L. I.

USSR

DOGADKIN, B. A., and TARASOVA, Z. N., Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov [1961 position] - "Influence of vulcanisation structures on physical and mechanical properties of vulcanisates" (Session II)

KUZ'MINSKIY, A. S., LYUBCHANSKAYA, L. I., FEL'DSHTEYN, L. S., Scientific Research Institute of Rubber Industry, Moscow [1960 locations] - "Influence of mechanical stresses on the ageing of vulcanised rubbers" (Session VIII)

NOVIKOV, A. S., GILINSKAYA, N. S., DYURAYEVA, T. N., GRIBACHEVA, A. V., NUDEL'MAN, Z. N., and GALIL-OGLY, F. A., Scientific Research Institute of Rubber Industry, Moscow [1961 locations] - "Investigation of amine vulcanisation of SKF-26 fluoro-co-polymer" (Session II)

REZNIKOVSKIY, M. M., and BRODSKIY, G. I., Scientific Research Institute of Tire Industry, Moscow - "Special features of the mechanism of abrasion of high-elastic materials" (Session V)

13

Report to be submitted for the 4th Rubber Technology Conference, London, England, 22-25 May 1962.

33728 S/138/62/000/001/006/009
A051/A126

15.9300
11.2211

AUTHORS: Lyubchanskaya, L.I.; Fel'dshteyn, L.S.; Kuz'minskiy, A.S.

TITLE: Rubber aging in the strained state

PERIODICAL: Kauchuk i rezina, no. 1, 1962, 23 - 29

TEXT: The authors investigated the major law sequences in the process of chemical relaxation of tension and studied the effect of various composition factors. The accumulation kinetics of residual deformation and changes of the equilibrium standard (proportional to the number of transverse chemical bonds), were further examined. Natural and sodium-butadiene rubber were chosen as the experimental material. An axial compression relaxometer was used to test the chemical relaxation of tension. It was found that the rate of the relative drop in tension does not depend on the compression degree within the 20 to 5% deformation range. The tension drop is the result of the break in the bonds under tension; the accumulation of the residual deformation is determined primarily by structurating. According to the rate increase of tension relaxation, the vulcanizates are arranged in the following sequence: thiuram < vulcanizate with sulfur and captax < vulcanizate with sulfur and diprenylguanidine. The rate con-

Card 1/3

Rubber aging in the strained state

stants of the relaxation process, calculated according to the monc-molecular reactions are: 1 : 6 : 39. With the presence of transverse bonds in the vulcanizates, the reactivity of the polymer, with respect to the oxygen, strongly affects the ratio of tension relaxation. Data obtained further revealed that: 1) in aging of the deformed vulcanizates there are two competing processes taking place - oxidizing destruction of the polymer's molecular chains, and a thermomechanical decomposition of the transverse sulfur bonds. 2) In the presence of strong transverse mono- or disulfide bonds in the vulcanizates, the chemical relaxation of tension is determined by the oxidizing destruction of the molecular chains of the polymer and thus, the relaxation rate depends in this case on the reactivity of polymers and oxygen concentration. 3) Various carbon blacks (channel, furnace, thermal and lamp) increase the rate of chemical relaxation in the following sequence: channel > furnace > lamp > and thermal. The nature of the transverse bonds appears to be the main factor, determining the behavior of rubber in aging under conditions of static deformations. The selection of the appropriate polymer followed by the filler range next in importance. It is concluded that in rubber aging in the presence of oxygen, the tension relaxation process is determined by a thermal break of the transverse bonds for rubbers with polysulfide bonds and by thermo-oxidizing destruction of the polymer in vul-

Card 2/3

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S/138/62/000/001/006/009
A051/A126

Rubber aging in the strained state

canizates with strong transverse bonds. There are 8 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry)

Card 3/3

S/844/62/000/000/098/129
D234/D307

AUTHORS: Kuz'minskiy, A. S., Fel'dshteyn, L. S., Zhuravskaya, Ye. V. and Lyubchanskaya, L. I.

TITLE: Radiation ageing of rubbers in stressed state

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 576-580

TEXT: Stress relaxation was investigated by means of an axial compression relaxometer described in a previous paper. The compression degree was 20%. Specimens were irradiated by a Co^{60} source, the dose being varied from 0.5 to 1 Mr/hr. The specimens consisted of vulcanized natural НК (NK), butadiene-nitryl СКН-26 (SKN-26), sodium-butadiene СКВ (SKB) and butadiene-styrene СКС-30 (SKS-30) rubbers. With respect to the velocity of relaxation, NK > SKV > SKS-30 > SKN-26, and with respect to that of residual deformation, SBK > NK > SKN-26 > SKS-30. Structurization and destruction outputs are compared. Presence of anti-radiation substances (N-phenyl-N'-

Card 1/2

cyclohexyl-p-phenylenediamine and N,N'-diphenyl-p-phenylenediamine) in the quantity of 5% by weight did not affect the chemical relaxation rate but slightly affected the rate of accumulation of residual deformation and decreased considerably the rate of structurization. The rate of residual deformation was decreased by anti-radiation substances only in the case of irradiation in air but not in vacuum. There are 4 figures and 1 table.

ASSOCIATION: NII rezinovoy promyshlennosti (NII of the Rubber Industry)

L 13662-63 EWP(j)/EPF(c)/EWT(m)/BDS AFFTC/ASD Pc-4/Pr-4 RM/WW

ACCESSION NR: AP3001428 S/0138/63/000/004/0017/0020

AUTHOR: Lyubchanskaya, L. I.; Degteva, T. G.; Angert, L. G.; Kuz'minskiy, A. S.

TITLE: Accelerated method for determining the guaranteed storage life span of vulcanized rubbers

SOURCE: Kauchuk i rezina, no. 4, 1963, 17-20

TOPIC TAGS: vulcanized rubber, storage life, creep, stress, relaxation, thermal aging, extension

ABSTRACT: The principle of the method proposed by the authors consists in extrapolating the recorded aging rate of rubbers at high temperatures to fit the thermal conditions of the storage place. To this end it was important not only to select tests sensitive to changes associated with the aging of rubber but also to make sure that the said changes were proceeding at an even rate. Depending on the actual conditions of storage, the thermal accelerated aging test must be conducted on rubbers either under stress or without it, and in the medium the rubber is surrounded with. It is suggested that the thermal tests be conducted in series at 20C intervals, with an upper temperature level of 90-100C for natural rubber for natural rubber and 110-130C for synthetic rubber. In the present investigation stress was chosen as an index of aging. It was conducted on 10x10-mm plugs of vulcanized SKN-18 rubber

Card 1/2

L 13662-63

ACCESSION NR: AP3001428

under longitudinal pressure stress in an oil medium at 50, 70, 90, and 110C. The magnitude of the stress, sigma, was measured initially and after various time intervals. From these, the kinetics of continuous relaxation of stress as well as the storage life span of rubber SKN-18 at 25C were calculated, the latter amounting to nine years, which approximates the figure found from practice. Orig. art. has: 9 formulas and 3 charts.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promy*shlennosti (Scientific Research Institute of Rubber Industry)

SUBMITTED: 00	DATE ACQ: 30May63	ENCL: 01
SUB CODE: 00	NO REF SOV: 009	OTHER: 003

Card 2/3/2

L 4282-66 EWT(m)/EPF(c)/EWP(v)/EWP(j)/T WW/DJ/RM
ACCESSION NR: AP5024105 UR/0138/65/000/009/0013/0016
678.06:626.762.004.17

AUTHOR: Lyubchanskaya, L. I.; Tsapina, N. A.; Kus'minskiy, A. S.

TITLE: Study of relationship between chemical stress relaxation and decrease of the fatigue life of sealing substances

SOURCE: Kauchuk i rezina, no. 9, 1965, 13-16

TOPIC TAGS: vacuum seal, hermetic seal, natural rubber, nitrile rubber, stress relaxation

ABSTRACT: The article deals with the loss of airtightness of a vacuum system as a result of contact leakage, which occurs when the contact stress falls below a certain critical value owing to aging of the sealing substance. A special apparatus was constructed in order to determine the relationship between the contact stress and the airtightness of a vacuum system, and to study the effect of various factors on the critical stress. Ring gaskets made of rubbers differing in polymer type, vulcanizing groups, filler type, and degree of filling were tested. Studies of gaskets based on natural, fluorinated (SKF-26), butadiene-nitrile (SKN-26), and silicone (SKTV-1) rubber showed that loss of vacuum

Card 1/2

L 4282-66
ACCESSION NR: AP5024105

3

occurs at approximately the same contact stress, equal to 1 - 2 kg/cm^2, independent of the type of rubber, aging temperature, or degree of deformation. Orig. art. has: 5 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry)

4455

SUBMITTED: 00 ENCL: 00 SUB CODE: MT,

NO REF SOV: 005 OTHER: 000

Card 2/2 DP

FUCHIK, Yulius [Fucik, Julius] [1903-1943]; MALEVICH, O. [translator]; LYUBECHANSKAYA, N., red.; SKIBA, T., tekhn.red.

[Central Asia] O Srednei Azii. Tashkent, Gos.izd-vo khudozh. lit-ry UzSSR, 1960. 257 p. (MIRA 14:2)

(Soviet Central Asia--Description and travel)
(Fucik, Julius, 1903-1943)

KRAKOVSKIY, A.I.; LYUBCHANSKAYA, S.I. (Kemerovo, ul. Sovetskaya, d.106, kv. 14)

Lipoma of the mediastinum. Grud. khir. 5 no.2:114-115 Mr-Ap'63 (MIRA 17:2)

BRAKSH, T.A.; KAZAKOVA, Z.A.; POPOVA, A.V.; LYUBCH/NSKAYA, Z.I.

Role of dietary fat in the development of experimental hypertension. Vop. pit. 22 no.3:22-28 My-Je '63. (MIRA 17:8)

1. Iz laboratorii vysshey nervnoy deyatel'nosti (zav. - prof. A.I. Mordovtsev) Instituta pitaniya AMN SSSR i TSentral'noy nauchno-issledovatel'skoy laboratorii zhirovoy promyshlennosti (zav. - kand. tekhn. nauk A.A. Shmidt), Moskva.

LYUBCHANSKAYA, Z.I.; VOL'VOVSKAYA, Ye.A.

Fortification of margarine with soy phospholipides. Masloboyno Zhirovaya Prom. 18, No.4, 20-1 '53. (MLRA 6:4)
(CA 47 no.16:8278 '53)

1. Moscow Margarine Factory.

LYUBCHANSKAYA, Z.I., inzhener.

Deodorizing fats with citric acid. Masl.-zhir.prom. 18 no.6:28-30 Je '53. (MLRA 6:6)

1. Tsentral'naya laboratoriya Glavraszhirmaslo. (Oils and fats) (Citric acid)

RZHEKHIN, V.P., starshiy nauchnyy sotrudnik; BODYAZHINA, Z.I.; VENGEROVA, N.V.; VISHNEPOL'SKAYA, F.A.; GALUSHKINA, L.A.; GAVRILENKO, I.V.; GRAUERMAN, L.A.; IRODOV, M.V.; KARANTSEVICH, L.G.; KREYSINA, R.A.; KUPCHINSKIY, P.D.; LEVIT, M.S.; LEONT'YEVSKIY, K.Ye.; LITVINENKO, V.P.; LYUBCHANSKAYA, Z.I.; MAZYUKEVICH, V.A.; MAN'-KOVSKAYA, N.K.; NEVOLIN, F.V.; POGONKINA, N.I.; POPOV, K.S.; PREMET, G.K.; SARKISOVA, V.G.; SEMENOV, Ye.A.; STERLIN, B.Ya.; SERGEYEV, A.G., kand.tekhn.nauk, obshchiy red.; PRITYKINA, L.A., red.; TARASOVA, N.M., tekhn.red.

[Technical and chemical production control and accounting in the oils and fats industry] Tekhnokhimicheskii kontrol' i uchet proizvodstva v maslodobyvaiushchei i zhiroperererabatyvaiushchei promyshlennosti. Moskva, Pishchepromizdat. Vol.1. 1958. 403 p.
(Oil industries) (MIRA 13:1)

BODYAZHINA, Z.I.; VENGEROVA, N.V.; GEYSHINA, K.V.; GRAUERMAN, L.A.; IRODOV, M.V.; KARANTSEVICH, L.G.; KRAL'-CSIKINA, G.A.; KUPCHINSKIY, P.D.; LEONT'YEVSKIY, K.Ye.; LITVINENKO, V.P.; LYUBCHANSKAYA, Z.I.; MAZYUKEVICH, V.A.; MAN'KOVSKAYA, N.K.; NEVOLIN, F.V.; POGONKINA, N.I.; POPOV, K.S.; PREMET, G.K.; RZHEKHIN, V.P., starshiy nauchnyy sotrudnik; SARKISOVA, V.G.; SEMENOV, Ye.A.; STERLIN, B.Ya.; TIPISOVA, T.G.; SERGEYEV, A.G., kand.tekhn.nauk, red.; PRITYKINA, L.A., red.; GOTLIB, E.M., tekhn.red.

[Technochemical control and production accounting in the oils and fats industry] Tekhnokhimicheskii kontrol' i uchet proizvodstva v maslodobyvaiushchei i zhirorerabatyvaiushchei promyshlennosti. Moskva, Pishchepromizdat. Vol.2. [Special methods in the analysis of raw material and semiprocessed and finished products] Spetsial'nye metody analiza syr'ia, polufabrikatov i gotovoi produktsii. 1959. 495 p. (MIRA 13:5)
(Oil industries) (Oils and fats--Analysis)

L 1920-65

ACCESSION NR: AT5006103 S/[illegible]000/64/000/000/0035/0041

AUTHOR: Lyubchanskiy, E. N.

B+1

TITLE: Behavior of a citrate complex of plutonium-239 i[illegible] rats after inhalation

SOURCE: Raspredeleniye, biologicheskoye deystviye, usko[illegible]eniye vyvedeniya radioaktivnykh izotopov (Distribution, biological effect, acc[illegible]leration of the excretion of radioactive isotopes); sbornik rabot. Moscow, Izd-vo [illegible]editsina, 1964, 35-41

TOPIC TAGS: plutonium-239, radioisotope, inhalation, lu[illegible]g, gastrointestinal tract, bone, half-life, radioactivity

ABSTRACT: Immediately after a citrate complex of Pu^{239} [illegible]was inhaled by the animals, 50, 18.7, 28.8, and 2.6% of the activity in the organism [illegible]was found in the gastrointestinal tract, head, lungs, and viscera, respectively. The amount of Pu^{239} in the gastrointestinal tract decreased 100-fold in 8 days, 1,000-fold in 32 days. The radioisotope was removed from the lungs during four periods differing in time and portion of the isotope removed: (1) about 9% with a half-life of a few minutes; (2) about 56% with a biological half-life of 19 hours; (3) 65% of the activity noted after 24 hours was removed with a half-life of 7[illegible] days; (4) 35% with a half-life of 137 days. After 64 days the amount resorbed w[illegible]s 35-40% of the original

Card 1/2

L 34920-65

ACCESSION NR: AT5006103

content in the lungs. The amount deposited in the skeleton and liver did not exceed 25% and 6%, respectively, of the original content in the lungs. Clearance from the liver, starting the 32nd day, proceeded with a biological half-life of 119 days. Most of the resorbed Pu^{239} was deposited in the skeleton from the first day. The concentration of the radioisotope in the lungs exceeded that in the skeleton throughout the investigation. Orig. art. has: 1 figure, 6 tables.

ASSOCIATION: none

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 2/2

L 34919-65

ACCESSION NR: AT5006104 S/0000/64/000/000/0042/0061

AUTHOR: Yerokhin, R. A.; Koshurnikova, N. A.; Lyubchanskiy, E. R.; Nifatov, A. P.; Reshetov, G. N.

TITLE: Content and microdistribution of plutonium-239 in rat lung and liver and morphological changes in these organs after intratracheal administration of the isotope

SOURCE: Raspredeleniye, biologicheskoye deystviye, uskoreniye vyvedeniya radioaktivnykh izotopov (Distribution, biological effect, acceleration of the excretion of radioactive isotopes); sbornik rabot. M., Izd-vo Meditsina, 1964, 42-61

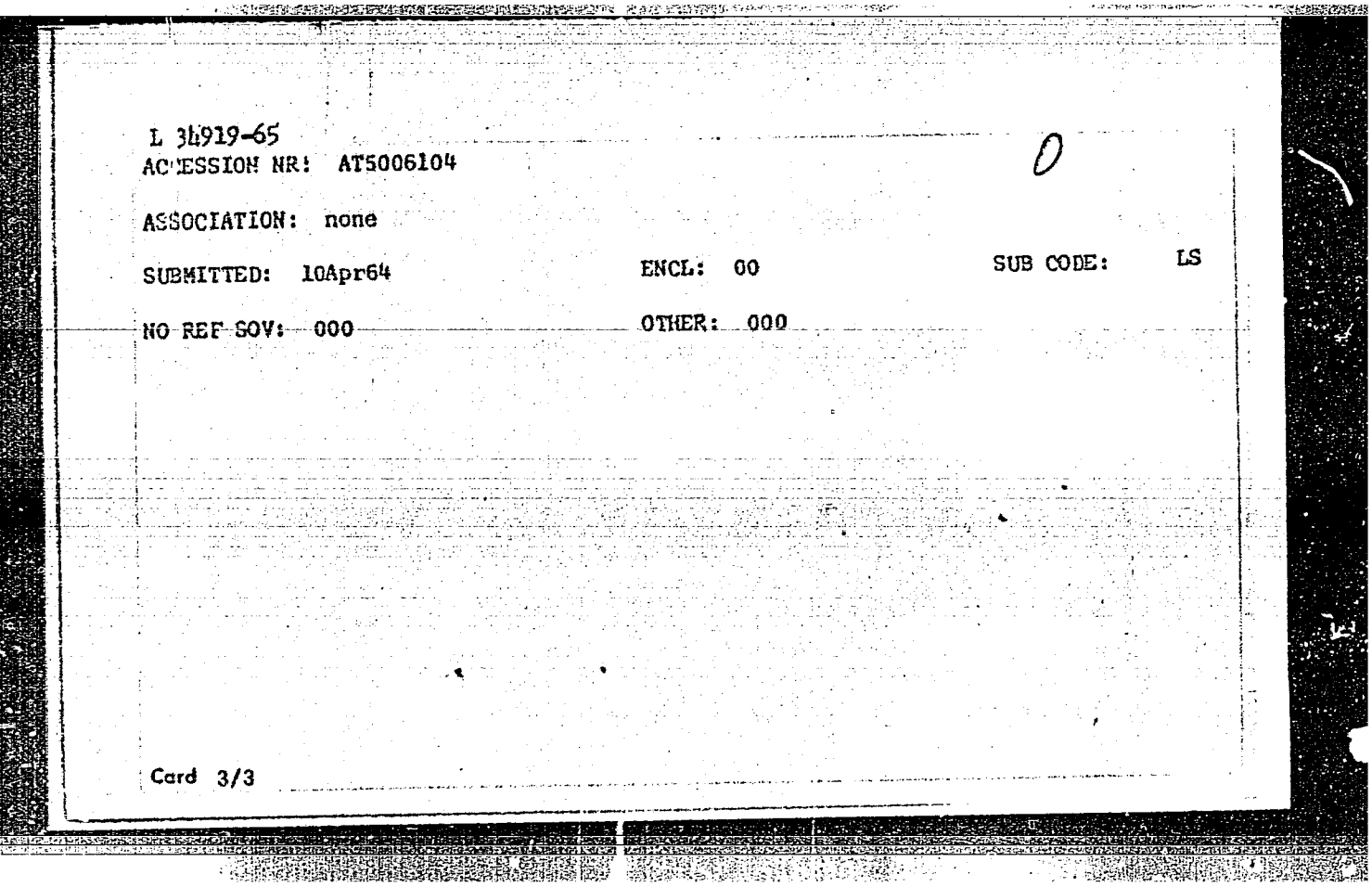
TOPIC TAGS: plutonium-239, radioisotope, inhalation, liver, lung, pathology, radioactivity, lymphatic system

ABSTRACT: The behavior of plutonium in the lung following intratracheal administration of various salts is determined largely by the physicochemical form of the compound used. The plutonium content of the lungs after administration of the nitrate was 5-10 times higher than after administration of sodium plutonyl triacetate. The clearance of plutonium administered in the form of these two salts obeys the exponential law, but it was more rapid in the case of the second salt. A large quan-

Card 1/3

tity of plutonium was transported from the lungs by macrophages into the regional lymph nodes. Plutonium accumulated in the liver during the early phase (20 minutes to 24 hours) more slowly after administration of the nitrate than it did after administration of sodium plutonyl triacetate. During the later phases (4 to 6 months) the rate of deposition in the liver was about the same after administration of either form of plutonium - 0.90-0.56 and 0.95-0.57% of the dose administered.

The microdistribution of plutonium in rat liver after intratracheal administration of the two plutonium salts was quite diffuse. Histological changes in the lung varied with the nature of the microdistribution of the element and they arose mainly in the places where the isotope concentrated. The severity of the pathological changes and the time when they developed were related to the ionization dose that accumulated. Among the earliest changes were degeneration, desquamation of bronchial and alveolar epithelium, and perivascular edema. These were followed by chronic inflammation, chiefly productive in character. The pathological process developed into pneumosclerosis as a result of the proliferation of connective-tissue cellular elements with the formation of fibrous structures. No significant morphological changes were noted in the liver after intratracheal administration of 7 μc/kg of plutonium nitrate or sodium plutonyl triacetate. Orig. art. has: 15 figures, 2 tables.



L 34919-65
ACCESSION NR: AT5006104 0

ASSOCIATION: none

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

L 34923-65
ACCESSION NR: AT5006113 S/0000/64/000/000/0117/0123

11
B+1

AUTHOR: Lyubchanskiy, E. R.

TITLE: Behavior of plutonium-239 citrate in rats after single and repeated intraperitoneal injection of the isotope

SOURCE: Raspredeleniye, biologicheskoye deystviye, uskoreniye vyvedeniya radioaktivnykh izotopov (Distribution, biological effect, acceleration of the excretion of radioactive isotopes); sbornik rabot. Moscow, Izd-vo Meditsina, 1964, 117-123

TOPIC TAGS: plutonium-239, radioisotope, liver, muscle, bone, half-life, radioactivity

ABSTRACT: Five days after a single intraperitoneal injection of Pu^{239} citrate, the animals were found to contain 13.8 ± 0.84% of the administered dose in the liver, 3.72 ± 0.16% in the femur, 0.81 ± 0.05% in the scapula, and 2.11 ± 0.16% in the muscles. Eighty-five percent of the isotope was excreted from the liver with a biological half-life of 7 days, and 15% with a biological half-life of 125 days; 35% was excreted from the spleen with a biological half-life of 31 days and 65% with a biological half-life of 600 days. Pu^{239} was excreted from the femur, scapula, and muscles with a biological half-life of 840, 700, and 108 days,

Card 1/2

L 34923-65
ACCESSION NR: AT5006113

respectively. The age of the rats affected the rate of deposition and excretion of Pu^{239}. In the femur and scapula of old rats (18 months), 5 days after injection of the isotope, 2' and 20% less was deposited than in young animals (3 months). The rate of excretion was twice as high in the old animals. The behavior of Pu^{239} after repeated injection differed from its behavior after a single injection in that it was followed by a gradual decrease in deposition of the isotope in the femur and scapula along with an increase in excretion with feces. The deposition of Pu^{239} in the liver and muscles was wavelike in character. Orig. art. has 6 tables.

ASSOCIATION: none

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 2/2

[redacted]

[redacted] of hazar[redacted] the body of rats following [redacted] by inhalation, [redacted]
[redacted]:45-49 Ja '65. (MIT [redacted])

LYUBCHANSKIY, L.

Driver-innovator L. Bolokan. Avt. transp. 34 no.10: 35 O '56. (MLRA 9:12)

1. Glavnyy inzhener 47-y avtokolonny.
(Bolokan, L.)

L 18457-66 EWT(d)/EWP(1) IJP(c) BB/GG
ACC NR: AP6006381 SOURCE CODE: UR/0413/66/000/002/0114/0115

INVENTOR: Lyubchanskiy, M. S.

39
B

ORG: none

TITLE: A memory unit. 60,44 Class 42, No. 178167

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 2, 1966, 114-115

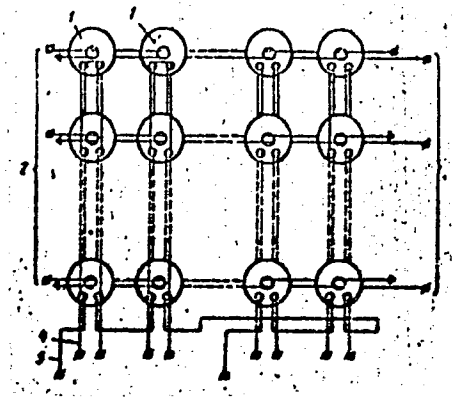
TOPIC TAGS: computer storage device, memory core, control circuit

ABSTRACT: This Author's Certificate introduces a memory unit containing matrices of multiple-aperture magnetic elements with interrogator windings passed through one aperture, output windings passed through the other apertures and bias windings passing through the same apertures as the interrogator windings. The control circuit for the device is simplified by dividing each matrix in half and passing the interrogator and bias windings in the same direction through the apertures in one half of the matrix and in opposite directions in the other half.

Card 1/2 UDC: 681.142

L 18457-66

ACC NR: AP6006381



1 - magnetic element; 2 - output windings; 3 - recording windings; 4 - interrogator winding; 5 - bias winding.

SUB CODE: 09/ SUBM DATE: 20Jul64

Card 2/2 7119 5

LYUBCHENKO, A., inzh.

Special problems of assemblying the DT-20 tractor after repair.
Tekh. v sel'khoz. 20 no.6:69-72 Je '60. (MIRA 13:10)
(Tractors--Maintenance and repair)

LYUBCHENKO, A.A.

Modernization of the MKG-8 excavator. Gor.zhur. no.7:50-55 Jl '60. (MIRA 13:7)

1. Glavnyy inzhener Izohorskogo zavoda, Kolpino, Leningradskoy oblasti.
(Excavating machinery)

LYUBCHENKO, Aleksandr Aleksandrovich; SINYAKOV, Yu.I., red.; LEVONEVSKAYA, L.G., tekhn.red.

[Our technical committee] Nasha tekhnicheskaia komissiia. Leningrad, Len'izdat, 1959. 23 p. (MIRA 13:3)

1. Glavnyy inzhener Izhorskogo zavoda (for Lyubchenko).
(Efficiency, Industrial)

85129
S/182/60/000/005/006/006
A161/A029

11200

AUTHORS: Lyubchenko, A.A.; Aristarkhov, N.T.

TITLE: Die Inserts for Hot Stamping of Large Parts

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 5, pp. 47 - 49

TEXT: Stamping large bottoms for vessels, separators, filters and autoclaves from sheet steel requires large dies and their making costs are high at Izhorskiy zavod (Izhora Works), ranging from 37,500 rubles for a 7.5-ton ring die for a 1,000 mm diameter bottom to 375,000 rubles for a 75-ton die for a bottom 3,000 mm in diameter. To cut costs in small lot production "technological inserts" are used either on the inside of the bottom blank, or on the outside, or from both sides. The inserts, of same material as the blank, are welded to the blank on the periphery, and the weld must not fail in stamping. To eliminate bevelling, the insert diameter is taken 20 - 30 mm smaller than the bottom blank diameter. The welds are removed after stamping by chisel or by gas cutter. Using inserts of different thickness one and the same bed die may be used for stamping bottoms of different thickness and different diameter. The inserts can be made of steel sheet cuttings welded together, so their cost is not high. Steel with

Card 1/4

85129

S/182/60/000/005/006/006
A161/A029

Die Inserts for Hot Stamping of Large Parts

different expansion coefficient must not be used for blank and insert, for then the welds will inavoidably fail in stamping. A clearance of up to 2 mm per 1 meter length must be allowed between blank and inserts because of possible gas accumulation between them, which is dangerous for the press operator when gas bursts out. The surfaces of blanks and inserts are covered with a very liquid graphite suspension in water. Graphite forms a film preventing welding-together and ensures a bright surface on stamped work. Three figures show different insert combinations. Thinning of bottom metal on smaller radius in the die is the same as in stamping without inserts, but if an insert is used on the outside of the blank the bottom thickness will be even throughout. The Izhora works produced 65 stamped bottoms of 10 different types and dimensions in 1959 using the described method, and only 75,000 rubles were spent for the making of inserts, whilst the usual stamping would take the making of 5 bed die sets or 10 exchangeable punches, weighing a total of 170 tons, at a cost of 850,000 rubles. There are 4 figures.

Card 2/4

LYUBCHENKO, A.A.

S/137/61/000/012/082/149
A006/A101

AUTHORS: Vasichev, B. N., Latyshev, V. K., Pliskin, Yu. S., Felinger, A. K., Lyubchenko, A. A., Farfel', Yu. A., Lebedev, O. P., Ivanov, V. I.

TITLE: A device to measure the thickness of hot rolled metal

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 12, 1961, 13-14, abstract 12D92 (V sb. "Radioakt. izotopy i yadern. izlucheniya v nar. kh-ve SSSR, vol. 3" Moscow, Gostoptekhizdat, 1961, 205, 206)

TEXT: An instrument for measuring the thickness developed at TsNIIChM, is based on the method of dynamic compensation. The device consists of a receiving unit, a container of the measuring source, an electric driven clamp, a feed unit, a recording and an indicating unit. To control the operation of the device a coarse-wedge sector is mounted. The device is employed in a thickness range from 14 to 44 mm; it can however be designed for any range within 5 to 50 mm. In the case of the given model the device is an indicating one. It is intended to be incorporated into the programming unit, controlling the clamping screws of the mill, as a correcting device on periodic-rolling mills, and as an indicator in an automated reduction control system on continuous mills. The accuracy

Card 1/2

3

S/137/61/000/012/082/149
A006/A101

A device to measure the thickness ...

of the device is ± 0.1 mm on the whole range; the operational speed is one measurement per second.

N. Yudina

[Abstracter's note: Complete translation]

Card 2/2

ACC NR: AP7002999 (A,N) SOURCE CODE: UR/0413/66/000/024/0104/0104

INVENTOR: Forisenkov, S.A.; Lyubchenko, A.A.; Danilevskiy, O.F.; Belov, V.A.; Kagan, E.S.; Filimonov, D.I.; Lagoshnaya, Yu.M.; Kholodnik, N.P.; Belorossova, A.S.; Korshunov, V.A.

ORG: none

TITLE: A method of producing clad steel sheets. Class 49, No. 189671

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 24, 1966, 104

TOPIC TAGS: sheet metal, metal cladding, stainless steel, metal rolling

ABSTRACT:

This Author Certificate introduces a method of producing stainless steel-clad steel sheets by rolling electric-arc faced slabs. To increase the resistance against intergranular corrosion, facing is done with a flat electrode from a stainless chromium-nickel steel containing not less than 0.8% niobium. [MS]

SUB CODE: 11, 13/ SUBM DATE: 20Nov62/ ATD PRESS: 5114

Card 1/1 UDC: 621.791.92

S/135/61/000/001/016/018
A006/A001

AUTHOR: Lyubchenko, A.I., Engineer

TITLE: On Welding in Water Vapor Atmosphere

PERIODICAL: Svarochnoye proizvodstvo, 1961, No. 1, pp. 47 - 48

TEXT: Semi-automatic welding in water vapor was introduced at the Stalino Plant of Agricultural Machinebuilding for the manufacture of some metal structures of agricultural machines, in particular, cultivator plows. The welding conditions are: 200 amps current, 30 v arc voltage; wire feed rate 172 m/hr. The vapor jet length in operational position is 120 mm. To improve seam formation a looping motion of the burner is performed. The burner is operated at a back-angle; the inclination angle should not exceed 25°, the operational space of the electrode is about 25 mm. Best results were obtained at a vertical position of the electrode in respect to the surface to be welded. The use of Sv-08 welding wire yields a weld strength of 38-42 kg/mm^2, which is sufficient for many parts of agricultural machines. Results obtained are in agreement with experimental data supplied by the Plant imeni 15-letiye LKSMU.

ASSOCIATION: Stalinskiy zavod sel'skokhozyaystvennogo machinostroyeniya (Stalino Plant of Agricultural Machinebuilding)

Card 1/1

PUSTOVALOV, I.I., inzh.; LEBEDEV, K.S., inzh.; LYUBCHENKO, A.M., inzh.; MATVEYEV, V.A., inzh.. Prinimal uchastiye SHAPOSHNIKOV, A.V.. BLOKHINA, V.V., red.; PECHENKIN, I.V., tekhn.red.

[Approximate time norms for repair work; metal machining, fitting, fitting-assembly, electric welding, gas welding, and forging operations for collective farms and state farms] Primernye normativy vremeni na remontnye raboty; mekhanicheskaia obrabotka metallov, slesarnye, slesarno-sborochnye, elektrosvarochnye, gazosvarochnye i kuznechnye raboty dlia kolkhozov i sovkhozov. Moskva, Izd-vo M-va sel'skogo khoz. SSSR, 1960. 199 p. (MIRA 13:6)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po voprosam truda i zarabotnoy platy.
(Machine-shop practice)

ARTEM'YEV, Yu.N., kand. tekhn. nauk; ASTVATSATUROV, G.G., inzh.; BARABANOV, V.Ye., inzh.; BARYKOV, G.A., inzh.; BISNOVATYY, S.I., inzh.; GALAYEVA, L.M., inzh.; GAL'PERIN, A.S., kand. tekhn. nauk; GAL'CHENKO, I.I., inzh.; GONCHAR, I.S., kand. tekhn. nauk; DEGTYAREV, I.L., kand. tekhn. nauk; DYADYUSHKO, V.P., inzh.; YERMAKOV, I.N., inzh.; ZHOTKEVICH, T.S., inzh.; ZUSMANOVICH, G.G., inzh.; KAZAKOV, V.K., inzh.; KOZLOV, A.M., inzh.; KOROLEV, N.A., inzh.; KRIVENKO, P.M., kand. tekhn. nauk; LAPITSKIY, M.A., inzh.; LEBEDEV, K.S., inzh.; LIBERMAN, A.R., inzh.; LIVSHITS, L.G., kand. tekhn. nauk; LOSEV, V.N., inzh.; LUKANOV, M.A., inzh.; LYUBCHENKO, A.M., inzh.; MAMEDOV, A.M., kand. tekhn. nauk; MATVEYEV, V.A., inzh.; ORANSKIY, N.N., inzh.; POLYACHENKO, A.V., kand. tekhn.nauk; POPOV, V.P., kand. tekhn. nauk; PUSTOVALOV, I.I., inzh.; PYTCHENKO, P.I., inzh.; PYATETSKIY, B.G., inzh.; RABOCHIY, L.G., kand. tekhn. nauk; ROL'BIN, Ye.M., inzh.; SELIVANOV, A.I., doktor tekhn. nauk; SEMENOV, V.M., inzh.; SKOROKHOD, I.I., inzh.; SLABODCHIKOV, V.I., inzh.; STORCHAK, I.M., inzh.; STRADYMOV, F.Ya., kand. tekhn. nauk; SUKHINA, N.V., inzh.; TIMOFEYEV, N.D., inzh.; FEDOSOV, I.M., kand. tekhn. nauk; FILATOV, A.G., inzh.; KHODOV, L.P., inzh.; KHROMETSKIY, P.A., inzh.; TSVETKOV, V.S., inzh.; TSEYTLIN, B.Ye., inzh.; SHARAGIN, A.M., inzh.; CHISTYAKOV, V.D., inzh.; BUD'KO, V.A., red.; PESTRYAKOV, A.I., red.; GUREVICH, M.M., tekhn. red.

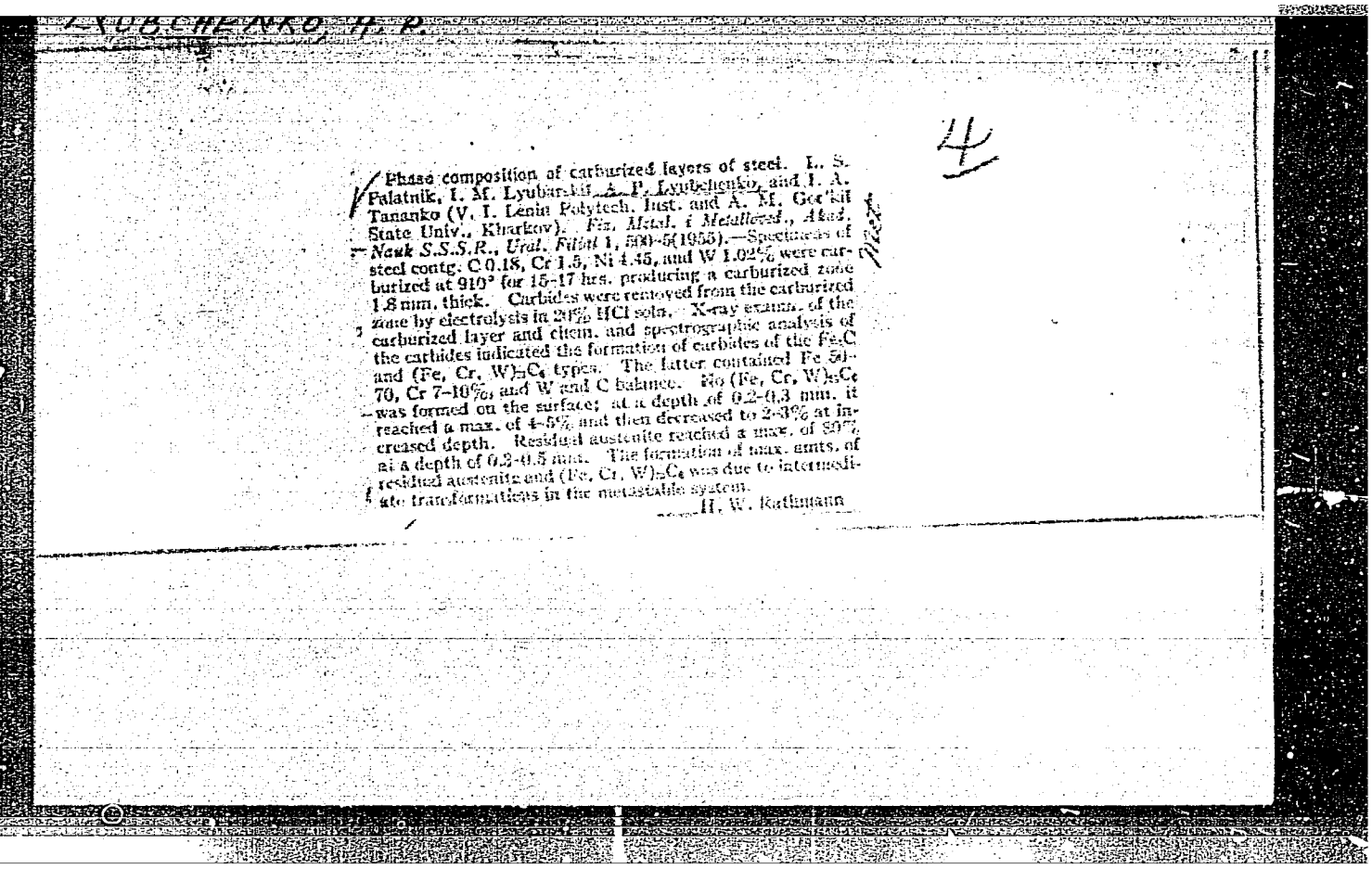
(Continued on next card)

ARTEM'YEV, Yu.N.—— (continued) Card 2.

[Manual on the repair of machinery and tractors] Spravochnik po remontu mashinno-traktornogo parka. Pod red. A.I.Selivanova. Moskva, Sel'khozizdat. Vols.1-2. 1962. (MIRA 15:6)
(Agricultural machinery—Maintenance and repair)
(Tractors—Maintenance and repair)

PUSTOVALOV, I.I.; LEBEDEV, K.S.; LYUBCHENKO, A.M.; MATVEYEV, V.A.; DMITIYEV, I.N., red.; SOKOLOVA, N.N., tekhn. red.

[Setting technical norms in repair workshops] Tekhnicheskoe normirovanie v remontnykh masterskikh. Moskva, Sel'khozizdat, 1962. 270 p. (MIRA 15:7)
(Repairing--Standards)



LYUBCHENKO, A. P.

4

Phase composition of carburized layers of steel. L. S. Palatnik, I. M. Lyubarskii, A. P. Lyubchenko, and I. A. Tananko (V. I. Lenin Polytech. Inst. and A. M. Gor'kii State Univ., Kharkov). *Fiz. Metal. i Metalloved., Akad. Nauk S.S.S.R., Ural. Filial* 1, 500-5(1955).—Specimens of steel contg. C 0.18, Cr 1.5, Ni 4.45, and W 1.02% were carburized at 910° for 15–17 hrs. producing a carburized zone 1.8 mm. thick. Carbides were removed from the carburized zone by electrolysis in 20% HCl sola. X-ray exam. of the carburized layer and chem. and spectrographic analysis of the carbides indicated the formation of carbides of the Fe_3C and $(Fe, Cr, W)_3C_6$ types. The latter contained Fe 50–70, Cr 7–10%, and W and C balance. No $(Fe, Cr, W)_3C_6$ was formed on the surface; at a depth of 0.2–0.3 mm. it reached a max. of 4–5% and then decreased to 2–3% at increased depth. Residual austenite reached a max. of 50% at a depth of 0.3–0.5 mm. The formation of max. amts. of residual austenite and $(Fe, Cr, W)_3C_6$ was due to intermediate transformations in the metastable system.

—H. W. Kuhlmann

LYUBCHENKO, A.P.

Investigation of the process of sulfidization of steel. I. M. Lyubarskii, D. V. Vorobofailov, Z. A. Shevchenko, and A. P. Lyubchenko. *Tekhnol. Transport. Mashino-stroeniya* 1955, No. 2, 12-15; *Referat. Zhur., Met.* 1956, Abstr. No. 9024.—X-ray structural analysis and the method of active isotopes (irradiation of Cr). are best for examn. of sulfidized films, the depth of S penetration into metal, and the distribution of different sulfides according to the depth of layer. Diffusion of S into metal to a great depth during sulfidization increases. A. N. Pestoff

LJUBCHENKO, A.P.

ON THE STRUCTURE AND WEAR RESISTANCE OF CASE-HARDENED STEEL. Presented at the Interna-
tional Conference on Radioisotopes in Scientific Re-
search, Paris, [illegible]
RIC-31 [illegible]
Ljubchenko. London Pergamon Press, Ltd. [illegible]

LYUBCHENKO, A.P.

"On the Structure and Wear Resistance of Case-Hardened Steel," L.S. Palatnik, I.M. Lyubarsky, A.P. Lyubchenko, Moscow, USSR

Paper presented for presentation at the International Conference on Radioisotopes in Scientific Research, Paris, 9-20 Sep 1957.

Moscow Aviation Inst, Min Higher Education, USSR

SOV/137-58-8-17811

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 231 (USSR)

AUTHORS: Palatnik, L. S., Lyubarskiy, I. M., Lyubchenko, A. P.

TITLE: On the Formation of the Carburized-layer Structure in Steel (O formirovanii struktury tsementirovannogo sloya stali)

PERIODICAL: Uch. zap. Khar'kovsk. un-t, 1957, Nr 95, Tr. Khim. fak. i N.-i. in-ta khimii KhGU, Vol 18, pp 75-91

ABSTRACT: Investigations were performed in order to determine how the wear-resistant properties of steel 18KhNVA are affected by the structure of steel obtained as a result of various heat-treatment procedures applied to the steel after carburization. The wear resistance (WR) was determined with the aid of radioactive isotopes on roller-shaped specimens 50 mm in diameter and 7 mm wide. The steel was rendered active by introduction of radioactive Co^{60} into molten metal. The active rollers operated in contact with three inactive rollers, 50 mm in diameter and 10 mm wide, mounted in a special stand which simulated the operation of a gear transmission. The extent of wear was determined by measurement of the radioactivity of the lubricant by means of a counter. In one revolution, the velocity of

Card 1/3

On the Formation of the Carburized-layer Structure in Steel

sliding on the surface of a roller changed from -1 to +1 m/sec. It was established that quenching the metal in water or oil immediately after carburization greatly increases WR and resistance to pitting as compared with the procedure in which the part is quenched and tempered at 650°C after the cementation pot had been cooled in air. The improvement in WR properties can not be explained by transformation of the retained austenite into martensite during the process of friction, because metallographic and X-ray analyses indicate that the amount of austenite present in the specimen is the same before and after the tests for wear. The WR is impaired as the content of retained austenite in the carburized layer is increased under slow cooling after carburization. Rapid cooling after carburization results in a considerable increase in WR. X-ray analysis of the substructure of austenite crystal lattice after slow and rapid cooling indicates that the lattice suffers a slight microdeformation if cooled abruptly from the carburization temperature; the solid solution exhibits a maximum of Cr and C saturation which determines the high WR of the carburized layer. A significant microdeformation of the crystal lattice occurs upon slow cooling. Slowly cooled austenite loses a good deal of its ability for deformation and hardening when resisting external forces. The results of the present work were verified on 6- and 10-mm thick gears with a module (reciprocal of pitch diameter) of 5 and a root-circle diameter

On the Formation of the Carburized-layer Structure in Steel

of 100 mm. Quenching of the gears in water immediately after carburization increased their WR by a factor of 2.5. An explanation is given for the nature of the "white zone" which appears in a thin surface layer during friction, as well as under impact and in the course of hardening by shot peening.

N. K.

1. Steel--Mechanical properties 2. Steel--Carbonization
3. Steel-- Structural analysis 4. Cobalt isotopes
(Radioactive)--Applications

Card 3/3

Lyubchenko, A. P.

20-3-14/52

AUTHORS: Palatnik, L. S., Lyubchenko, A. P.

TITLE: Diffusion in Solid Solutions of Variable Concentration (O diffuzii v tverdykh rastvorakh s peremennoy kontsentratsiyey)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 3, pp. 407 - 410 (USSR)

ABSTRACT: In the present paper an equation is suggested which describes the diffusion in alloys (solid solutions) with variable concentration of the components and in systems with tension- or temperature gradients. In deriving the equations the non-constancy of the values of α_i (the significance of α_i is not mentioned) and of M_i (number of atoms impinging on a surface of $1cm^2$) is taken into account. No new parameters are introduced and no special assumptions are made. The authors verified this equation experimentally, on which occasion they discovered the effect of counter-diffusion in the cementation of the steel. This counter-diffusion manifests itself by a current of iron atoms and of the atoms of the alloying metals towards the surface of the sample to be cemented. On this occasion a gradient of the activation energy Q of the self-diffusion of the iron is produced. For the computation of the current of the counter-diffusion the authors use the solution of the diffusion equation. The computation is described in detail. A formula for the

Card 1/3

computation of the excess concentration of the Fe-vacancies in the cemented layer is then given. For the determination of the diffusion curve during cementation a thin layer or radioactive iron was applied electrolytically on to the samples to be investigated. The following cementation took 15 hours at a temperature of 910° in a carburizer. The radioactivity of the sample was measured by registering the γ-quanta. The dependence of the specific activity of the layers upon depth thus obtained is illustrated by a diagram. The curve has a maximum with a considerable decrease of the specific activity near the surface, which confirms the existence of a counter-diffusion of the iron. The existence of a counter-diffusion can be confirmed by an additional series of experiments. The relaxation times necessary for the coalescence of the vacancies in the macroscopic pores have the same order of magnitude as the duration of the diffusion annealing. Therefore, the concentration of vacancies can be somewhat lower than the computed value. There are 2 figures, and 6 non-Slavic references.

20-3-14/52

Diffustion in Solid Solutions of Variable Concentration

ASSOCIATION: Khar'kov State University imeni A. M. Gor'kiy
(Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo)

PRESENTED: June 17, 1957, by S. A. Vekshinskiy, Academician

SUBMITTED: June 15, 1957

AVAILABLE: Library of Congress

Card 3/3

LYUBCHENKO, A.I., Cand Tech Sci--(diss) "Study of diffusion processes in a cemented layer of steel and its resistance to wear by means of radioactive isotopes." Kharkov, 1959. 11 pp (Min of Higher Education UkrSSR. Kharkov Polytech Inst im V.I. Lenin), 100 copies. List of author's works at end of text (12 titles) (KL,26-59,111)

LYBCHENKO, A P.

129-58-5-15/17

Scientific-Technical Conference on Metallography and Heat Treatment, Khar'kov 1957

about 0.15 mm with a grain size of 10^{-4} cm. It was also established that cavitation loading of monocrystals of aluminium does not bring about appreciable distortions in the crystal lattice. The obtained results confirm the existence of impact brittle fracture of the metal during cavitation erosion. The assumption is expressed that brittle fracture of the metal under conditions of cavitation erosion is due to the propagation of stress waves caused by the shock effect of the cavitation bubbles. Electro-spark hardening of the surface of steel does not increase the cavitation stability due to the brittleness of the hardened layer. Nitriding improves appreciably the cavitation stability of the steel. The properties of the steel depend to a considerable extent on the distribution of the alloying elements between the phases and within the limits of the individual phases. Radio-isotopes permit establishing the character of the distribution of alloying elements along the grain of the steel and also its changes during high temperature annealing and during cooling.

Card 13/20

Engineer A. P. Lybchenko reported on investigations of the distribution of alloying elements in chromium-nickel steels

Scientific-Technical Conference on Metallography and Heat Treatment, Khar'kov

by means of radio-active isotopes. By means of autoradiography it was established that there is a redistribution of carbon during the intermediate transformations in the case hardened layer of the Steel 18KhNVA. Using radio-active tracers, he studied the redistribution of chromium between the carbides and the solid solution. The obtained experimental data can be utilised in the selection of the optimum heat treatment regime of steel.

Engineer V. Ya. Litvinenko (imeni Kirov Turbine Works) reported on the thermomagnetic analysis of austenitic steels. As a result of graduation of the thermomagnetic apparatus on the basis of the data obtained from investigating the phase composition, a relation was obtained between the indications of the instrument and the iron concentration in standards and also on the magnetic susceptibility of the specimens. This enabled quantitative analysis of the content of the ferromagnetic phases in austenitic steels. By means of thermomagnetic analysis the presence was established of four ferromagnetic phases in the Steel 1Kh18N9T, each of which have differing

1. ЛУЦВСНЕНКО, А. П.

28(5) PHASE I BOOK EXPLOITATION SOV/2632

Akademiya nauk SSSR. Institut mashinovedeniya

Trenlye i iznos v mashinakh; sbornik XII (Friction and Wear in Machines; Collection 12) Moscow, Izd-vo AN SSSR, 1958. 354 p. Errata slip inserted. 4,000 copies printed.

Ed.: M.M. Khrushchov, Professor; Ed. of Publishing House: M.A. Babichev; Tech. Ed.: Ye.V. Zelenkova; Editorial Board: Ye.M. Gutyar, Professor, A.K. D'yachkov, Professor, I.V. Kragel'skiy, Professor, A.D. Kuritsyna, Candidate of Technical Sciences, L.Yu. Fruzhanskiy, Candidate of Technical Sciences, and M.M.Khrushchov, Professor.

PURPOSE: This book is intended for scientists, engineers, and technicians in the field of machine manufacture and operation, and for instructors in schools of higher education (vuzes).

COVERAGE: This collection of articles presents the results of new investigations in the field of wear, friction, and lubrication. The subjects discussed include structural changes in the surface layer of metals in friction, development of friction-brake materials, and theoretical investigations in the field of dry friction and friction with boundary and complete friction. For the abstract of each article see the Table of Contents. A bibliography of Soviet and non-Soviet materials on friction, wear and lubrication for 1954-55 prepared by Ye.O. Vil'dt is included.

SOV/123-59-16-64534

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 16, p 125 (USSR)

AUTHORS: Palatnik, L.S., Lyubarskiy, I.M., Lyubchenko, A.P.

TITLE: On Phase Transformations in Cemented Steel Layers

PERIODICAL: Tr. Khar'kovsk. politekhn. in-ta, 1958, 14, 153 - 159

ABSTRACT: The transformation of austenite into martensite and their distribution in the cemented layer of 18KhNVA steel was investigated. The preliminary treatment of the samples: cementation at 910°C during 24 hours with solid carburizing agent, containing 93% of charcoal, and subsequent air-cooling; tempering at 650°C during four hours; oil-hardening at 810°C and tempering at 150°C during 2 hours. Depth of cemented layer -1.8 ± 0.1 mm. X-ray photos were taken in the chamber with focusing by the Bolin method and in the Debye chamber in iron rays. After cementation to a depth of about 0.5 mm the maximum of residual austenite is formed, the position of which is not changed in the course of the following operations. The general distribution of the residual austenite over the depth of the layer after tempering and hardening with tempering is approximately alike. The surface decarbonization of the cemented layer, the mechanical interaction of the

Card 1/2

On Phase Transformations in Cemented Steel Layers SOV/123-59-16-64534

latter with the core, the migration of the alloying elements and their re-distribution between austenite and carbides is not the cause of the characteristic distribution of the phases over the depth of the layer and was not confirmed by tests. A diffusion re-distribution of C in the austenite, when cooled slowly, was discovered, which preceded the non-diffusion $\gamma \rightarrow \alpha$ transformation. The distribution of residual austenite with the maximum is connected with a decrease in resistance of the over-cooled γ -phase at a deviation from the eutectoid concentration of C. 17 references.

B.V.N.

Card 2/2

67664
SOV/126-8-6-12/24

18.8200

AUTHORS: Lyubarskiy, I.M., Lyubchenko, A.P. and Bakakin, G.N.

TITLE: Resistance to Wear of Case-Hardened Steel and Its Submicrostructure

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 6, pp 872-877 (USSR)

ABSTRACT: Lyubarskiy, Lyubchenko et al (Ref 1,2) have suggested that the apparently different effect of residual austenite in the carburized layer os steel on wear resistance is due to differences in submicrostructure. The present authors suggest that other phases should also be considered and give the results of their experimental study of the wear resistance, submicrostructure and degree of alloying of the phases in the carburized layer of steel containing different quantities of residual austenite. A carburized layer in 18 KhNVA steel subjected to various heat treatments (table) was used, wear being determined with the aid of radioactive iron and cobalt. The radioactivity of the lubricant was measured and the autoradiography of the wear products was effected. The submicrostructure of the alpha and gamma phases were established by harmonic analysis of the form of the (211)

Card 1/3

Resistance to Wear of Case-Hardened Steel and Its Submicrostructure

and (311) interference lines, respectively (Ref 7). Results are tabulated for specimens heat treated in various ways and before and after wear. The wear and rates of wear are plotted against the logarithm of testing time in Fig 1 for the different conditions. Curves of microhardness against time for two of the conditions are shown in Fig 2. The results show that the cooling conditions after case-hardening affect wear resistance greatly, eg a high resistance with the same residual-austenite content by rapid cooling is obtained. Friction conditions also affect wear resistance and during friction the submicrostructure changes. It has previously been shown (Ref 2) that cooling rate does not influence carbide distribution with respect to depth but does affect the degree of saturation of the carbide phase with alloying elements, particularly chromium, and the authors discuss these factors in relation to the present investigation and the behaviour of different components during wear. Their general conclusions are that the best wear resistance surface can be obtained through a correct assessment of processes occurring in the active layer

4

Resistance to Wear of Case-Hardened Steel and Its Submicrostructure

during friction. In the test procedure used (pure sliding of the radioactive specimen over a standard disc, or under conditions resembling gear meshing - Ref 6 -) high wear-resistance is obtained when there is a considerable residual-austenite content in the carburized layer in which the gamma- and alpha-phase crystals are in the "un-work-hardened" and "work-hardened" states, respectively. Professor L.S.Palatnik contributed valuable advice in this work. There are 2 figures, 1 table and 15 Soviet references.

ASSOCIATION: Zavod transportnogo mashinostroyeniya g. Kharkov (Transport Machine Construction Works, Khar'kov)

SUBMITTED: March 9, 1959

Card 3/3

LYUBCHENKO, A. P., LYUBARSKIY, I. M., AND GERASIMENKO, K. S.

On the Effect of the Thin Sulfide Film Which Forms Over the Friction Surface During the Process of Wear on the Wear-Resistance of Steel

Povysheniye iznosostoykosti i sroka sluzhby mashin. t. 2 (Increasing the Ware Resistance and Extending the Service life of Machines. v. 2) Kiyev, Izd-vo AN UkrSSR, 1960 290 p. 3,000 copies printed. (Series: Its: Trudy, t. 2)

Sponsoring Agency: Vsesoyuznoye nauchno-teknicheskoye obshchestvo mashinostroitel 'noy promyshlennosti. Tsentral 'noye i Kiyevskoye oblastnoye pravleniya. Institut mekhaniki AN UkrSSR.

Editorial Board: Resp. Ed.: B. D. Grozin; Deputy Resp. Ed.: D. A. Draygor; M. P. Braun, I. D. Faynerman, I. V. Kragel 'skiy; Scientific Secretary: M. L. Barabash; ED. of v. 2: Ya. A. Samokhvalov; Tech. Ed.: N. P. Rakhlina.

COVERAGE: The collection contains papers presented at the Third Scientific Technical Conference held in Kiyev in September 1957 on problems of increasing the wear resistance and extending the service life of machines. The conference was sponsored by the Institut stroitel 'noy mekhaniki AN UkrSSR (Institute of Structural Mechanics of the Academy of Sciences Ukraninian SSR), and by the Kiyevskaya oblastnaya organizatsiya mauchno-tekhnicheskogo obshchestva mashinostroitel 'noy promyshlennosti (Kiyev Regional Organization of the Scientific Technical Society of the Machine-Building Industry.)

LYUBCHENKO, A. P.

PHASE I BOOK EXPLOITATION SOV/5053

Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh. 3d, 1958.

Iznos i iznosostoykost', Antifriktsionnyye materialy (Wear and Wear Resistance; Antifriction Materials) Moscow, Izd-vo AN SSSR, 1960. 273 p. Errata slip inserted. 3,500 copies printed. (Series: Its: Trudy, v. 1)

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya.
Resp. Ed.: M. M. Khrushchov, Professor; Eds. of Publishing House: N. Ya. Klebanov, and S. L. Orpik; Tech. Ed.: T. V. Polyakova.

PURPOSE: This collection of articles is intended for practicing engineers and research scientists.

COVERAGE: The collection, published by the Institut mashinovedeniya, AN SSSR (Institute of Science of Machines, Academy of Sciences USSR) contains papers presented at the II Vsesoyuznaya Konferentsiya po treniyu i iznosu v mashinakh (Third All-Union Conference on Friction and Wear in Machines) which was held April 9-15, 1958. Problems discussed were in 5 main areas: 1) Hydrodynamic Theory of Lubrication and Friction Bearings (Chairman: Ya. M. Ostrer, Doctor of Technical Sciences, and A. K. D'yachkov, Doctor of Technical Sciences); 2) Lubrication and Lubricant Materials (Chairman: G. V. Vinogradov, Doctor of Chemical Sciences); 3) Dry and Boundary Friction (Chairman: B. V. Deryagin, Corresponding Member of the Academy of Sciences USSR, and I. V. Kragel'skiy, Doctor of Technical Sciences); 4) Wear and Wear Resistance (Chairman: M. M. Khrushchov, Doctor of Technical Sciences); and 5) Friction and Antifriction Materials (Chairman: I. V. Kragel'skiy, Doctor of Technical Sciences, and M. M. Khrushchov, Doctor of Technical Sciences). Chairman of the general assembly (on the first and last day of the conference) was Academician A. A. Blagonravov. L. Ts. Pruzhanskiy, Candidate of Technical Sciences, was scientific secretary. The transactions of the conference were published in 3 volumes, of which the present volume is the first. This volume contains articles concerning the wear and wear resistance of antifriction materials. Among the topics covered are: modern developments in the theory and experimental science of wear resistance of materials, specific data on the wear resistance of various combinations of materials, methods for increasing the wear resistance of certain materials, the effects of friction and wear on the structure of materials, the mechanism of the seizing of metals, the effect of various types of lubricating materials on seizing, abrasive wear of a wide variety of materials and components under many different conditions, modern developments in antifriction materials, and the effects of finish machining on wear resistance. Many personalities are mentioned in the text. References accompany most of the articles.

Card 5/13

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AUTHORS: Lyubarskiy, I. M., Lyubchenko, A. P., Gerasimenko, K. S. (Engineers)

TITLE: Structure and Wear Resistance of Steel Surfaces After Parkerizing

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, Nr 3, pp 18-21 (USSR)

ABSTRACT: This is a report concerning experimental tests of steel 18KhNVA, to which some small admixtures of radioisotope Co^{60}_{27} were added during smelting. The samples were heat-treated by various methods. After heat treatment and parkerizing, the samples (15 mm diameter, 9 mm high) were tested under the conditions of pure sliding and abundance of lubrication on friction test machine shown in Fig. 1.

Card 1/3

Structure and Wear Resistance of Steel Surfaces After Parkerizing

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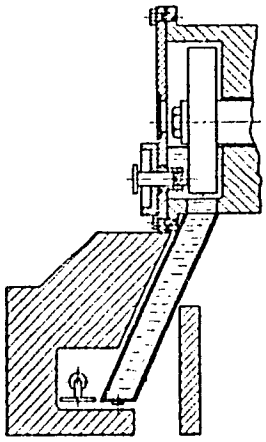

Fig. 1. Diagram of a machine for wear-testing of samples.

Card 2/3

Structure and Wear Resistance of Steel Surfaces After Parkerizing

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The speed of sliding equalled 1.7 m/sec and specific pressure was 0.3 kg/mm^2. The flat surface of friction disk and the samples were ground. After each test the disk was replaced. The degree of wear was judged by the integral radioactivity of oil measured by MS-4 meter and B-2 radiometer. The authors arrived at the following conclusions. (1) Parkerizing increases total wear resistance of friction surface, which is determined by the amount of products of wear passed into lubrication and were transferred upon conjugated surface. The lower is the material's hardness the higher is the effect of parkerizing. (2) The increased wear resistance of the surface after parkerizing is the result of a change in physicochemical properties of friction surface, which decreases the tendency of material to "seizing" in the point of contact.

There are 4 figures; 1 table; and 4 Soviet references.

Card 3/3